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REPORT OF THE WORKING GROUP ON CAPITAL FORMATION AND NATIONAL ACCOUNTS AT CONSTANT PRICES (FOR ENGLISH-SPEAKING COUNTRIES)

Addis Ababa, Ethiopia, 23 September - 2 October 1987

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A. ATTENDANCE AND ORGANIZATION OF WORK

1. The Working Group was held at ECA Headquarters, Addis Ababa, from 28 September - 2 October 1987. The meeting was opened by the Chief, Statistics Division, on behalf of the Executive Secretary of the Economic Commission for Africa.

2. The Working Group was attended by representatives of the following member States of the Commission: Angola, Botswana, Ethiopia, Guinee, Kenya, Lesotho, Madagascar, Mali, Niger, Rwanda, Sudan, Somalia, Uganda, Zaire and Zimbabwe.

3. The Working Group was organized in two sessions (one in English and the other in French).

4. For the English-speaking group Mr. Saad Eldin Ibrahim (Sudan) was elected Chairperson, Ms. S.Mushiri (Zimbabwe) Vice Chairperson and Mr. Mokhahlane (Lesotho) as Rapporteur.

B. AGENDA

5. The English-speaking session of the Working Group adopted the following agenda:

1. Opening address
2. Election of officers
3. Adoption of the agenda
4. Capital formation in national accounts:
   - (a) Definition
   - (b) Needs and uses
   - (c) Country practices and problems
   - (d) Methodology for estimating:
     - (i) fixed capital formation
     - (ii) changes in stocks
     - (iii) depreciation
   - (e) Basic data requirements

5. National accounts at constant prices:

   (a) Concepts

   (b) Needs and uses

   (c) Country practices and problems

   (d) Methodology for estimating:

      (i) value added at constant prices

      (ii) expenditure components at constant prices

      (iii) real income

   (e) Basic data requirements

6. Other business

7. Recommendations

8. Evaluation of the working group

9. Adoption of the report

C. ACCOUNT OF PROCEDINGS

Opening address

6. The Working Group was opened by the Chief, ECA Statistics Division, on behalf of the Executive Secretary of the Economic Commission for Africa.

7. In his opening address the Executive Secretary acknowledged the progress in the field of national accounting which had been achieved in most countries in the African region since 1960. He noted that the progress was reflected in the quality as well as the quantity of national accounts personnel and national expertise in these countries. Whereas in the past national accounts estimates for a large number of African countries were prepared by expatriate experts, now they are prepared mainly by Africans. The Executive Secretary recognized the efforts made by African governments in this regard. He also noted that such progress was a sign of self-reliance and should go a long way to ensure consistency and continuity in national accounts work and help put it on a more permanent basis.

8. He observed that if the effectiveness of capital investment in African countries is to be monitored, there is a need for reasonably reliable data to do so. He also emphasized the need for timely estimates of economic growth.

9. The Executive Secretary noted that the Working Group was taking place at a time when the African continent was only beginning to emerge slowly but resolutely from the economic and social crisis of unprecedented proportions in which it had recently been engulfed. Drought, famine, external debt and other economic and social events, have had very serious consequences for the continent's growth and development. This profound crisis had emphasized to African Governments, the need to take immediate, concerted and urgent action to ensure harmonious economic and social development, the directions, for which are contained in the Lagos Plan of Action and the United Nations Programme of Action for African Economic Recovery and Development (UN-PAARD), which built upon Africa's Priority Programme for Economic Recovery (APPER) and was adopted by the United Nations General Assembly in 1986.

10. Further he noted that self-reliant and self-sustaining development required a considerable body of data relating to the internal resources, actual and potential growth, etc., of the economies of member States. In these circumstances, timely, reliable and relevant national accounts were more important than ever.

11. Finally he thanked the Governments of member States for arranging finance for the travel and subsistence of participants, without which the workshop could not have taken place.

Capital formation in national accounts (Agenda item 4)

(a) Definition and (c) Country practices and problems

12. Under this item a representative of the secretariat presented document STAT/WG.NA/2.1(iii)/87/1, paragraphs 5-12 "Measurement of capital formation in national accounts". In doing so, the representative pointed out that according to the United Nations System of National Accounts (SNA), gross capital formation contains two major components, gross fixed capital formation and changes in stocks.

13. The secretariat drew the attention of the working group to the details of the items which are to be included, and also those that are not to be included, in gross fixed capital formation. It was further noted that the guidelines include the treatment of outlays by resident establishments on ships, aircraft, floating oil rigs and platforms intended for use mainly in international

waters or for leasing. Also included are guidelines on the treatment of outlays by embassies, consulates, military establishments and other diplomatic bodies as well as international agencies.

14. In the discussion which followed the presentation, most participants expressed agreement with the SNA definition of capital formation. In examining the details of the items recommended for inclusion in estimates of the aggregate, attention was focussed on item (b) of paragraph 7 of the document:

> "Outlays by producers on improvements and alterations of capital goods that significantly extend their expected life or substantially increase their productivity".

The view was expressed that it would be difficult for the national accountant to determine whether outlays on repairs were of this type or simply normal maintenance expenditures. Since in most cases the information is collected from the accounts of government, parastatals and business enterprises, the classification adopted in the business accounts would normally have to be accepted.

15. It was suggested that, where possible, explanation of what is required should be given to the respondent, e.g., on the questionnaire. In other cases the national accountant should seek further clarification from the supplier of the data.

16. Some participants expressed the view that very precise definitions were needed so that, where interviewers are used to collect data, the right type of data would be collected.

17. The case of multinational companies was cited as one which needed further clarification as to the treatment of their outlays, since they usually operate in countries other than the country of residence of the parent enterprise.

18. With respect to the recommendation that gross fixed capital formation should exclude outlays on non-reproducible tangible assets such as land, some representatives noted that usually when structures, e.g., buildings, are sold the cost of the land on which such structures stand is included in the sale price. In such cases, it would be difficult for the national accountant to separate the outlay into cost of land and cost of structure. It was suggested that in the circumstance the prevailing price of land in the locality should be used as an indicator.

19. The point was made that where real estate agencies build structures and then sell them to households, it might be difficult, where estimates of capital formation are made using the direct expenditure method, to determine whether the structure being reported as purchased by a household has already been reported in the capital outlay of the enterprise.

20. Questions were raised on the appropriate methodology to use in intercensal years when changes take place in the materials used in the structures of housing in the traditional or unorganized sector. It was noted that some of these changes might include charges for labour, bamboo or grass which were previously obtained free of charge; corrugated iron sheets used in place of banboo, bricks instead of mud and wattle, etc. In other words during these years houses which were neither modern nor traditional would have been constructed. It would therefore be inappropriate to continue to use the parameters which had been used for traditional housing to estimate capital formation in these cases. The suggestion was made that special surveys should be conducted with the help of architects and builders to assertain new norms until the results of a new housing census etc., are available.

21. In further reviewing the definition of fixed capital formation, it was noted that the SNA recommendation to include net purchases and breeding of draught animals, breeding stock, dairy cattle and sheep and other animals raised for wool and hair clip had not been followed in most countries of the African region. Some countries which import such animals treat such imports as capital formation, while other countries use information from surveys of large farms to classify at least some of these types of animals. As regards the rest of the livestock, i.e., small holdings, the farmer hardly reaches any decision, at the time of acquisition of the livestock, on the primary purpose for which it is going to be raised. Much would depend on his prevailing and future circumstances. If economic hardship confronts him, the livestock may be slaughtered; if his economic conditions are bouyant the livestock may be left to breed, produce milk or be kept for wool and hair clips. In such circumstances, it would be impracticable to distinguish between fixed capital formation and stocks. It was agreed that changes in such herd size should be treated as changes in stocks, and shown in a separate category if their importance warranted it.

22. The treatment of assets acquired under financial leasing arrangements was discussed. It was clearly difficult to distinguish these from other leases, unless they were specifically identified in the accounts. In particular it would not be known whether or not the proposed criteria had been met, viz: (a) the choice of item resting with the lessee, and
(b) the retention of the asset by the lessee over its whole useful life.

(b) Needs and uses

23. In introducing the agenda item a representative of the secretariat noted that data on the magnitude and composition of fixed capital formation are a main prerequisite for the formation of realistic development planning; this information is needed to formulate among other things, policy on capital formation, i.e., whether, for example, the present allocation of existing capital expenditures by type and by industry conforms to what might be desirable.

24. In his brief account of the needs and uses of capital formation statistics, the representative also noted that actually realized capital formation expenditures and their composition is indispensable for measuring the progress of a development plan and deciding what adjustments, restructuring, transformation, etc., are or would be cessary and at what points.

(d)(i) Methodology for estimating fixed capital formation

25. In introducing the agenda item, a representative of the secretariat referred to paragraphs 21-52 of document STAT/WG.NA/2.1(iii)/87/1.

26. The representative said that the main approaches of estimating the item are the direct method or expenditure approach and the commodity flow analysis which relies on various indirect approaches. He stated that most countries in the African region use the expenditure approach in estimating the gross fixed capital formation of the central, local, municipal government, public corporations, etc., and that the basic data are usually available in annual accounts and statements and are for the most part accurate and usually published without much time lag.

27. He informed the working group that most countries have used the commodity flow analysis for estimates of machinery and equipment than for construction. He then referred to the various steps to be followed in estimating fixed capital formation on construction and also machinery and equipment.

28. The representative reminded the meeting that the informal rural sector, where monetary and non-monetary transactions intermingle, contributes a very significant part of the gross domestic product of many African countries, and that estimate of the annual gross fixed capital formation needed to create this product should be made.

29. In the discussion which followed, participants raised questions on the practical problem of deciding which industrial sector to classify non-residential buildings occupied by establishments engaged in several different kinds of economic activity. The problems were (a) lack of the basic information on what activities were being carried out or intended to be carried out in the building, and (b) the demand on the resources of the national accounts unit in trying to find out such information.

30. Some participants informed the meeting that their country estimates of capital formation in the informal sector did not include estimates of the construction of traditional huts both because of the lack of resources required to conduct enquiries which would generate the information and because of doubts about the reliability and usefulness of such data.

31. Several representatives referred to the problem of making estimates of capital formation in the informal sector as principally one of the non-availability of basic data, including valuation, of the sector activities.

32. The classification of spare parts was discussed. it was said that some spares are easily recognized as capital items, while others which end up increasing significantly the expected life or productivity of an asset are generally impossible to identify separately. The problem was one of deciding which items were for normal maintenance and repairs and which were for rehabilitation (capital).

33. Questions were also raised on the treatment of structures which, though completed, were not being used, and were therefore not capital goods in the sense that they were not contributing to production. It was agreed that such structures had to be treated as fixed assets and that, if no output resulted, analysis would show the investment to have been a poor one. It was noted that if the asset was being depreciated in this situation, net operating surplus would be negative.

(d)(ii) Methodology for estimating changes in stocks

34. Under this item a representative of the secretariat drew the attention of the working group to paragraphs 53 through 70 of document STAT/WG.NA/2.1(iii)/87/1. He said that most African countries have had difficulty estimating this aggregate. For most countries data on stocks shown in the national accounts refer to stocks of important export products, data on which are readily available from marketing boards, public corporations etc., and some other main non-export commodities, such as livestock.

35. It was emphasized that it is the addition to inventories in the period of account, i.e., the value of the physical change in inventories that should be included in capital formation. This addition should be valued at purchasers' prices when acquired from other units and at producers' prices when produced by the unit owning the stocks.

36. In addition to the methods of estimating stocks mention was made of possible sources of the data and boundary problems. The attention of the working group was drawn to the fact that enterprises use different principles/methods in valuing stock, and that not all of these methods yield the type of data needed by the national accountant. In order to arrive at as close an approximation as possible of what is needed for national accounts, the reported figures of stocks at the beginning and end of a period of account should be revalued to reflect constant price level, preferably average market prices during the period. The difference between the revalued figures of stocks at the end and at the beginning of a period will then give the measure of the physical change in stocks required, valued at average prices of the accounting period.

37. Discussion centred on the SNA recommendation that work in progress on heavy machinery and similar items be included in stocks, but work in progress on construction be treated as gross fixed capital formation. It was not very clear how a power plant should be treated, being a mixture of construction and machinery. The Secretariat pointed out that the treatment was based on the notion that the purchaser is considered to take possession of construction work when it is put in place on site. This principle applies equally to any machinery and equipment made elsewhere and then put in place on site also. At this point the equipment would normally become the property of the purchaser; from the manufacurer's point of view the work is complete, although at an earlier stage it may have been part of his work-in-progress (SNA paragraphs 6.107 and 6.118 refer). The SNA suggests a distinction between complete and incomplete construction work, where the data permit.

38. The treatment of major spares was also discussed in this context. It was emphasized that the national accountant would be obliged in practice to classify these in whichever way the enterprise itself treated them in its accounts. It was said that typically the enterprise might consider them as part of their fixed assets, under "other equipment". If so, they could count as fixed capital formation in the national accounts.

(d)(iii) Methodology for estimating depreciation

39. The secretariat introduced this topic. It was emphasized that, of all the flows included in the SNA, this was the most difficult to estimate properly. The main reasons for this were that it was not an observable flow and had to be imputed, and that it was sensitive to assumptions about the life-span of the assets. It was also emphasized that figures of depreciation calculated by businesses, normally based on historic costs, had little meaning for economic analysis. The use of such data could lead to a substantial overstatement of net operating surplus in times of rapid inflation.

40. It was suggested further that there was relatively little interest on the part of users in depreciation figures as such or in figures of net national income. On the other hand there was considerable interest in data on total capital stock, the estimation of which was very much related to that of depreciation.

41. The calculations normally require (a) data on capital formation over several years by type of asset, (b) corresponding deflators, and (c) estimated life-span of each type of asset. One country indicated that it had set up a spreadsheet program to make the necessary calculations.

(e) Basic data requirements

42. Under this agenda item, a representative of the secretariat drew the attention of the group to document STAT/WG.2.1(iii)/87/1 paragraph 21 through 31. He noted that estimating capital formation is a complex exercise and that the sources of data for the estimates vary. For example in making estimates for the construction sector it is necessary to take into account the fact that this sector has non-capital activities such as repair and maintenance; as such, the total value of sales of the sector is not the same as the total of gross domestic fixed capital formation.

43. The representative reminded the group that details of construction activities of large enterprises could be obtained from tax returns. However in most countries of the region these returns usually cover a small part of the sector's activities. Population and housing censuses, establishment surveys, annual production surveys, ad-hoc special surveys, business and government accounts are the main sources of the basic data. Government investment expenditures are set out in the accounts and presents no difficulty except for those items of capital expenditure which may appear in the recurrent accounts and vice versa.

44. In many countries planning permission is needed for construction of dwellings, at least in towns, and the value and/or size of the dwelling is given. Although these permits are used as indicators of construction put-in-place, there are serious limitations: while some buildings turn out as planned, others end up being of a different size and value. It is necessary where possible to check, at least on a sample basis, the difference between work planned and work carried out. In countries with large rural communities, censuses of housing, either by accommodation, size or number of units, made at the time of, or in connection with, population censuses may be more appropriate for making estimates of capital formation. Similarly, community project construction in the rural areas can be covered by sample surveys.

45. It was noted that, for intercensal years, a number of country estimates for the rural sector have been based on the assumption that accommodation increases at the same rate as the population. The number of units estimated by this method should be valued at a cost per unit estimated from an actual sample; the breakdown of costs in terms of labour and materials can then be ascertained at the same time and used as a check on the product side. When estimating population growth for this purpose, consideration should be given to movements of the population from rural to urban areas, particularly if the sources of data for estimating investment in urban dwellings are different.

46. It was observed that business accounts alone are not a good guide to business investment. These accounts do not, for example, always specify whether a new purchase is a capital good or not. The attention of the group was drawn to the possibility of using supplementarty data found in the depreciation provision of the business to help the national accountant make a decision.

47. For gross domestic capital formation in vehicles, machinery, ships, aircrafts and other equipment, the foreign trade statistics provide the basic data, almost exclusively, for countries which do not produce these goods domestically. For countries which produce some of these goods, data on domestic production and imports less exports of similar machinery and equipment, are required. Trade and transport margins on imports and domestic supply can be obtained from special surveys.

National accounts at constant prices (agenda item 5)

(a) Concepts

48. Introducing this topic, a representative of the secretariat suggested that participants look at the first two sections of the paper "Methodology for estimating GDP at constant prices". (STAT/WG.NA/2.1(iii)/87/2). It was explained that the paper was intended for use as guidelines, and asked participants were asked to comment accordingly. The representative of the Secretariat described the contents of Section 2 (The theory). This was considered to be uncontroversial. However, there was a problem, raised by one participant, on the sectoral breakdown of real income. It was often the case that different sections of the population were affected differently by variations in the terms of trade. It was explained that estimates of real income of different groups could be prepared using deflators appropriate to each, but in general these measures could not be aggregated to make the total in the same way that the current price figures could be. In other words, additive consistency could not be maintained.

(b) Needs and uses

49. It was generally agreed that there were few statistics in greater demand than GDP at constant prices. Timely measures of the performance of African economies were constantly needed at sectoral, national and international level. It was noted that the figures were often misinterpreted, for example because of lack of understanding of the terms "current" and "constant" prices. The need for timeliness was well recognised by participants: policy makers needed up to date information so as to be in a position to take early remedial action if the situation required.

50. So much attention was focused on GDP at constant prices that by comparison the need for current price data appeared relatively minor. It was pointed out that the main (indeed the only) purpose of constant price estimates was to measure developments over time, while current price data provided information on the structure, of an economy. The balance of payments and government accounts were always expressed in current prices, and the relationships of these with the rest of the economy could only be shown using national accounts at current prices.

51. The demand for data was keenly felt, but constraints of data and resources often meant that it could not always be met. The demand for a tourism sector was mentioned. It was noted that although some sub-sectors of the economy could be identified as mainly serving tourists, others might serve both households and tourists and could not be classified uniquely. Tourists are a special category of consumer, and statistics of their

expenditure, whether integrated into the national accounts or not, provide a basis for analysis of the effects of tourism on the economy.

(c) Country practices and problems

52. The secretariat introduced paper STAT/WG.NA/2.1(iii)/87/3 which described the methods being used by some countries in Africa to estimate national accounts at constant prices. It was emphasized that the coverage was by no means complete, and country practices quoted were merely examples.

53. One of the problems which was identified at the outset was that in many cases the appropriate deflators were not available. Although every country collected consumer prices for their Consumer Price Indices (CPIs), there was a general lack of producer price collection systems. There was a general discussion of the problems associated with various sector estimates; broadly the methods described in the paper reflected those being used throughout the region.

(d) Methodology for estimating value added

54. The Secretariat introduced this topic by outlining the contents of Section 3 of the methodology paper. In this, two main points were emphasized. The first was the comparative difficulty of measuring 'second order' effects (i.e., economies of scale, or relatively minor changes in technologies) at constant prices - primary interest centres on straightforward measures of output. The second was the need to be aware of the assumptions implicit in the two major approximate methods: (i) the use of an indicator of gross output to project forward base-year value added, and (ii) the direct deflation of current value added. The arguments in favour of the first of these methods were generally accepted, given the tendency for trends in output prices and input prices to differ both in export markets and government controlled industries. The issues were illustrated with a practical example. In discussion, one participant pointed out that there were a number of cases in which the quantity of inputs might very well be used as a proxy indicator if outputs were difficult to quantify. The last paragraph of Section 3.3 of the paper would need to be amended accordingly.

55. Section 4 + 5 of the paper were also introduced. It was suggested that simple volume indicators are often preferable to deflated values because of errors generated from using prices which could not be directly associated with the values. However, there were frequent occasions where deflation was the only possibility. The apparent 'requirement' to construct Paasche price indices was shown to be spurious, since if this can be done, it must be possible to make the constant price estimates directly.

56. The revision and the rebasing of the national accounts were discussed. Attention was drawn to the recommended method of introducing a new benchmark, and revising the figures since the previous benchmark. A policy for revisions was needed. The revisionscould be done every year or when the required data had all been collected. The end might never be reached, however, so the revisions could be done regularly every few years. It was particularly appropriate to make revisions at the same time as rebasing. It was suggested that national accounts figures should be rebased at least every ten years, or more frequently if relative prices are changing rapidly. Rebasing the accounts required a great deal of planning and thought together with sufficient staff and other resources. If rebasing is put off too long then the national accounts figures will become more and more out of date.

57. A participant raised the issue of currency reform which had been undertaken recently in his country.The question was how to show the national accounts figures for previous years. No readily available solution existed. Similar changes had occurred in other countries, but it was not known how the national accounts figures for those countries had been treated.

58. The problem of GDP at current prices for electricity dropping lower than the GDP at constant prices was raised. It was also suggested that sales figures should be used rather than figures on the amount of electricity generated.

59. Participants discussed the problems of estimating government services as experienced in their respective countries. The CPI was not recommended as a good deflator for government services although a number of African countries had used it in the absence of better information. With regard to the wage-bill, it was suggested that this should include as many items of income in kind as possible. The inclusion of wages paid to volunteers from other governments in the wage-bill was suggested by one participant. It was noted that a paper on the SNA review had suggested that these wages should not be included since they may already have been included in the country of origin of the volunteer. It was suggested that a certain percentage of the wage-bill could be added each year to cover allowances, etc. This would partly avoid the underestimation of the wage-bill. Some participants felt that incentives paid to civil servants should be included in the wage-bill and that where such incentives are substantial and are not included an explanation ought to be provided by the national accounts in the form of a footnote.

60. The military spending figures have caused problem to many countries. It was reported that in many countries figures are reported in lumpsum form and no separate figures for equipment or wages are available. It was reported that in one country this was estimated by conducting a survey of military expenditure; hence the percentage wage-bill of the military spending and the percentage used to buy equipment, etc., was established.

61. It was generally straightforward to deflate the expenditure components of GDP. This could be done at the global level (e.g., by applying the CPI to estimates of household consumption, etc.) However, it was preferable to construct the estimates at a more detailed level. Imports and exports (of services as well as goods) needed to be expressed at constant prices, using as far as possible data on quantities to project base year values. For some items quantities were not meaningful, in which case a deflator was needed, based on the prices of more homogeneous items. If on the other hand real income was to be calculated, then the balance of trade had to be deflated as a money flow in terms of its purchasing power.

62. In general the estimates at constant prices obtained through the expenditure approach will differ from those constructed by sector of activity. The reason for such differences must be investigated particularly if they are wide. This might lead to the construction of commodity flow accounts, in which the supply and demand for each commodity or group of commodities is estimated and balanced. An even more sophisticated method involves the compilation of a series of input/output tables. However it was pointed out that this exercise requires very considerable resources.

(e) Basic data requirements

63. In view of the high demand for timely estimates, it was suggested that statistical offices need a system of rapid data collection from major enterprises to help formulate early estimates of GDP. Agricultural production estimates were also needed and might be found in the agricultural department.

64. In the discussion, the need for such data was appreciated. However, some participants pointed out that: (a) there were other needs in addition to those of the national accounts, and (b) the national accountants were reliant on other sections. In addition to the need for proper timetables for this work, the need for the national accountant to act as a catalyst and to follow up on his colleagues at all stages of their work was emphasized.

Conclusions and main recommendations (agenda item 6)

65. The following conclusions and recommendations were reached by the meeting.

General

(a) It was extremely valuable for national accounts to assemble at meetings such as this to discuss common problems. Monolingual training is the preferred format. It would be very useful if ECA could also provide training at country level for wider groups of nationals.

(b) Ways of estimating informal (including traditional) activity need to be discussed, including the associated data collection.

Capital formation

(c) Precise guidelines, together with appropriate software, are needed for the calculation of the stock of fixed capital and corresponding depreciation. Countries may not be able to afford to develop these procedures individually.

(d) In the African context, the split of livestock into (a) fixed capital, and (b) stocks was not appropriate (except in the case of a few large modern sector farms). Livestock was kept for many uses which could not be distinguished. In this case it may be classified to stocks.

(e) The SNA does not appear to cater for equipment goods etc., (e.g., military equipment) which are originally classified to consumption but which are sold to the private sector several years later as capital goods. This needs attention.

National accounts at constant prices

(f) National accountants should be alert in particular to the pitfalls of "double deflation" and of the direct deflation of value added at current prices. Volume indicators of production are often preferable, including deflated estimates of gross output.

(g) The guidelines presented to the meeting should be amended in the light of the discussions, and expanded to cover the expenditure side. They should be published and made widely available to national accountants.

(h) Figures must be scrutinized very carefully to ensure their plausibility. National accountants should not follow a particular method of estimation slavishly if it leads to non-sensical results.